

Remarks/Arguments:

Claims 1, 2, 7, 8, 10, 11, 15, 16, 28, 31, and 34 are presently pending. Reconsideration is respectfully requested in view of the following remarks.

Claim Rejections Under 35 U.S.C. § 103

Claims 1, 2, 7, 8, 10, 11, 15, 16, 28, 31, and 34 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Belveze et al. (US 5,917,861) in view of Son et al. (US 2003/0189892). Applicants respectfully traverse this rejection.

Applicants' claim 1 includes features that are not disclosed, taught, or suggested by the cited art, namely:

...mapping a bit stream in a data stream to the plurality of bands, respectively, in a first band order wherein the first band order indicates a mapping pattern for mapping the bit stream to the respective plurality of bands...

...mapping the bit stream to the same plurality of bands, as the plurality of bands used to map the bit stream in the first band order, in a second band order, wherein the second band order indicates a mapping pattern that is different from the mapping pattern of the first band order...

In an exemplary embodiment (a two-frame transmission technique), symbols are mapped to a set of bands in a first order in a first transmission. The symbols are then mapped to the same set of bands in a second order different from the first order in a second transmission. See the original application, for example, at paragraphs [0034]-[0039].

Preliminarily, Applicants submit that the Belveze and Son are not properly combinable to reject claim 1. In particular, Applicants submit that the Office Action fails to provide any articulated reasoning for combining the cited art. The Supreme Court's decision in *KSR* requires that an Office Action provide "some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." See M.P.E.P. § 2141(III).

The Office Action asserts that it would be obvious to combine the references "in order to improve the transmission reliability." Applicants note that Belveze is directed to a method of digital demodulation. The Office Action has failed to clearly point out how the cited portions of Son relate to digital demodulation, or how the cited portions would improve reliability in the

digital demodulation process described in Belveze. Applicants therefore submit that the Office Action has failed to provide any articulated reasoning along with some rationale underpinning for combining the teachings of Son with the subject matter of Belveze.

Accordingly, Applicants respectfully submit that Belveze and Son are not properly combinable. Even if the references were properly combinable, however, Applicants respectfully submit that the combination of the cited art fails to disclose, teach, or suggest all of the features of claim 1.

The Office Action acknowledges that "Belveze does not expressly teach a frequency diversity technique that maps a bit stream to multiple bands in a first band order and to multiple bands in a second band order, wherein the first band order and the second band order have different patterns but the same number of bands." Applicants agree, and respectfully submit that the remaining cited art fails to disclose, teach, or suggest at least the above features of claim 1.

Son is directed to an ARQ apparatus and method using frequency diversity. Son discloses an OFDM mobile communication system including a transmitter having a physical layer ARQ controller 211. The controller 211 determines whether to retransmit data using a replica generated by a replica generator 221. Replica generator 221 generates a replica through cyclic circulation. See Son at paragraphs [0031] and [0041].

The Office Action asserts that "Son teaches a frequency diversity technique that maps...input data to multiple bands in a first band order...mapping the same data to the same plurality of bands in a second band order [that] has a different mapping pattern than the first band order...." Applicants respectfully disagree.

Applicants respectfully submit that Son fails to disclose, teach, or suggest that the retransmitted data is mapped onto the same set of bands as the originally transmitted data. To the contrary, Son merely discloses generating a new symbol by cyclically circulating through a set of sub-carriers. See Son at paragraphs [0039]-[0041].

Furthermore, Applicant notes that Son can not be modified as suggested without changing it's principle of operation. As set forth in paragraphs [0009], [0010] and [0030] *et seq.*, the apparatus and method disclosed by Son concern a system using ARQ (Automatic Repeat Request) protocol. As explained in paragraphs [0006] and [0007] of Son, according to

the ARQ protocol, when data having a defect is received, the same data is resent in response to a resend request. Therefore, it is a fundamental condition (principle of operation) of Son that the same data is resent after a predetermined time has elapsed since the data was first sent.

If Son were modified as suggested in the Office Action, the principle of operation would change. Instead of resending the data at a different time, the data would be sent simultaneously in different band order. This, however, would be incompatible with ARC.

It is well settled that a reference can not be modified to render a claim obvious if the modification would change the principle of operation of the reference. "If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious."¹ Because the modification of Son proposed in the Office Action is incompatible with ARQ, Applicant asserts that the modification proposed in the Office Action is improper.

Accordingly, Applicants respectfully submit that Belveze in view of Son fails to disclose, teach, or suggest "mapping a bit stream in a data stream to the plurality of bands, respectively, in a first band order wherein the first band order indicates a mapping pattern for mapping the bit stream to the respective plurality of bands [and] mapping the bit stream to the same plurality of bands, as the plurality of bands used to map the bit stream in the first band order, in a second band order, wherein the second band order indicates a mapping pattern that is different from the mapping pattern of the first band order," as recited in claim 1.

Therefore, for the above reasons, claim 1 is allowable over the cited art. Reconsideration of claim 1 is respectfully requested.

Claims 7, 10, and 15, while not identical to claim 1, include features similar to the allowable features discussed above with respect to claim 1. Accordingly, claims 7, 10, and 15 are allowable over the cited art for the reasons set forth above with respect to claim 1. Reconsideration of claims 7, 10, and 15 is respectfully requested.

¹ MPEP §2143.01(VI) quoting *In re Ratti*, 123 USPQ 349 270 F.2d 810 (CCPA 1959)

Claims 2, 8, 11, 16, 28, 31, and 34 each depend from one of claims 1, 7, 10, and 15. Accordingly, claims 2, 8, 11, 16, 28, 31, and 34 are allowable over the cited art for the reasons set forth above with respect to claim 1. Reconsideration of claims 2, 8, 11, 16, 28, 31, and 34 is respectfully requested.

Conclusion

In view of the claim amendments and remarks set forth above, Applicants respectfully submit that the application is in condition for allowance. Notification to that effect is respectfully requested.

Respectfully submitted,



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